

AMENDMENTS TO THE CLAIMS

1. (CURRENTLY AMENDED) A finger print minutiae extraction method comprising:

acquiring fingerprint image data;

partitioning said fingerprint image data into at least one data block corresponding to a local area of said image data;

generating a histogram function of a contrast level of said image data corresponding to said at least one data block ~~data blocks~~, wherein a histogram of pixel intensity on a pixel by pixel basis is generated for said at least one data block;

performing a histogram transformation of said histogram function,

wherein said histogram transformation is adapted to the contrast level of said local area of said fingerprint image data and pre-enhanced fingerprint image data is generated with local enhancement.

2. (ORIGINAL) The method of claim 1, further comprising:

partitioning said fingerprint image data into a plurality of data blocks, each of said plurality of blocks corresponding to a different local area of said image data and at least one of said plurality blocks having a contrast level different than a second of said plurality of data blocks,

wherein said histogram transformation is adapted to said different contrast levels of said plurality of blocks and pre-enhanced fingerprint image data is generated with local enhancement for a plurality of local areas of said image data.

3. (ORIGINAL) The method of claim 1, wherein said histogram transformation includes using an objective function with a relatively high value at both endpoints of an intensity interval and a relatively low value at a middle of said intensity interval.

4. (ORIGINAL) The method of claim 1, wherein noise and distortions in said image data are reduced.

5. (ORIGINAL) The method of claim 1, wherein said histogram transform maps said histogram function to a specific function according to a mapping algorithm including

wherein $f(x)$ is a target histogram function and said target histogram function has low value at the mid-point and has a high value at the endpoint of the interval.

6. (ORIGINAL) The method of claim 1, further comprising:
performing orientation filtering on said pre-enhanced data using
directional convolution for two dimensional digital image processing,
wherein said pre-enhanced image data is smoothed and enhanced.

7. (ORIGINAL) The method of claim 6, wherein the following algorithm is
used in said orientation filtering.

8. (ORIGINAL) The method of claim 1, further comprising:
thinning said fingerprint image data to remove false connections of ridges
in said data,
wherein said thinning includes applying a first table and a second table
to a plurality of pixels using an algorithm.

9. (ORIGINAL) The method of claim 1, further comprising generating a
first table and a second table using rules for character data and biological data.

10. (ORIGINAL) The method of claim 9, wherein said rules for biological
data include

If $P1 * P7 * P8 = 1$ and $P2 + P6 > 0$ and $P3 + P5 = 0$ then $LUT1(P) = 0$;

If $P5 \cdot P6 \cdot P7 = 1$ and $P4 + P8 > 0$ and $P1 + P3 = 0$ then $LUT1(P) = 0$;

If $P1 \cdot P2 \cdot P3 = 1$ and $P4 + P8 > 0$ and $P5 + P7 = 0$ then $LUT2(P) = 0$; and

If $P3 \cdot P4 \cdot P5 = 1$ and $P2 + P6 > 0$ and $P1 + P7 = 0$ then $LUT2(P) = 0$,

wherein $A(P)$ is a number of 0-1 patterns in an order set $P1, P2, P3, P4, P5, P6, P7, P8, P1$, where $P_i, i=1, \dots, 8$, are 8-neighbors of a pixel in a clockwise direction, and $B(P)$ is a number of nonzero neighbors of P .

Claims 11-20 (CANCELLED).

21. (NEW) A finger print minutiae extraction method comprising:

acquiring fingerprint image data;

partitioning said fingerprint image data into at least one data block corresponding to a local area of said image data;

generating a histogram function of a contrast level of said image data corresponding to said at least one data block;

performing a histogram transformation of said histogram function,

wherein said histogram transformation is adapted to the contrast level of said local area of said fingerprint image data and pre-enhanced fingerprint image data is generated with local enhancement.